

ATTACHMENT 6

MONITORING, ASSESSMENT, AND PERFORMANCE MEASURES

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JOSHUA BASIN WATER DISTRICT RECHARGE BASIN AND PIPELINE PROJECT

Joshua Basin Water District will monitor construction bids, expenditures, and progress. Water supplied to the recharge project will be metered. Percolation of recharge water to groundwater will be monitored at a multi-level monitoring well constructed at the percolation pond site by the U.S. Geological Survey. The project is consistent with the Colorado River Region Basin Plan.

Performance measures and their indicators for this project are tabulated below.

Table 1 - Project Performance Measures, JBWD Recharge Project

Objectives and Goals	Desired Outcomes	Output Indicators	Outcome Indicators	Measurement Tools and Methods	Targets
1) Provide additional groundwater recharge, storage, and recovery capacity in the Joshua Basin region	Capability to recharge 2,000 af/yr of high-quality supplemental supply into the groundwater basin in a six-month period	These objectives and outcomes will be met by the construction of the project	These objectives and outcomes will be met by the construction of the project	These objectives and outcomes will be met by the construction of the project	Completion of recharge basin and conveyance pipeline
2) Allow the storage of water during wet hydrologic periods for recovery and use during dry periods, to provide JBWD customers with increased water supply reliability					
3) Reduce the demand for local groundwater					
4) Enhance water supply reliability					
5) Provide additional recharge to underlying groundwater basin, thereby reducing and/or reversing the degradation of local septic leachate on nitrate level buildup in District's water supply					
6) Take full advantage of total water supply available to the District - allowing acceptance of long-term State Water Project allocation, which have not been received due to lack of needed facilities					

7) Reduce or offset future economic impacts to the District customers by reducing need for extensive rate increases for water supply augmentation;	Cost-effective recharge system	The 2004 MWA IRWMP identified the project (in conjunction with water conservation) as the most-cost effective project for balancing demand with available supply		Construction bids and final construction cost	Complete project on
8) Reduce or eliminate risk of local ground subsidence caused by depleted groundwater levels within groundwater basin;	Stop decline of groundwater table elevation to prevent subsidence	Water level measurements showing stabilized or recovering groundwater elevations above historical lows	Halted or reduced ground subsidence; Water level measurements showing stabilized or recovering groundwater elevations above historical lows	A new multi-level monitoring well has been constructed at the recharge basin site by the USGS and will be used to monitor percolation of recharged water and its movement to the water table	Water level measurements showing stabilized or recovering groundwater elevations above historical lows of 500 feet bgs
9) Replenishment of local groundwater basin prevents need to design, drill and operate deeper water supply wells which would result from groundwater basin depletion	Reduce or eliminate mining of native groundwater				
10) Provides replenishment water to groundwater basin, needed as a result of reduced natural replenishment resulting from global climate change causing longer and drier drought periods	Provide net recharge in excess of extractions to allow storage accumulations for use in drought years	Water imports and water production will be metered and monitored	Accounting of net recharge in excess of extractions	Metering of import supply at connection to Morongo Pipeline; Metering of groundwater extractions at well head; Metering of use at individual connections	Provide net recharge of 2,000 af/yr in first 10 years of project operation

HI-DESERT WATER DISTRICT WASTEWATER TREATMENT AND WATER RECLAMATION PROJECT

The Hi-Desert Water District (HDWD) will monitor construction bids, expenditures, and progress. Water influent to the wastewater plant metered. Effluent quality and quantity will be measured at the treatment plant. Percolation of recharge water to groundwater will be monitored at a multi-level monitoring well adjacent to the percolation ponds. HDWD has adopted and Mitigated Negative Declaration and Mitigation Monitoring and Reporting Program (MMRP). Groundwater quality will be measured adjacent to the percolation ponds monthly, consistent with the MMRP.

Groundwater monitoring: A minimum of three monitoring wells will be constructed around the percolation ponds in an array that provides determination of the hydraulic gradient of the effluent that is percolating into the groundwater basin. Typical sampling will eventually be quarterly or semi-annually but will be more frequent, weekly or monthly, at start up to establish baseline.

Influent monitoring: At a minimum, average daily flow and pH, TSS BOD, plus possible other constituents will be monitored daily.

Effluent monitoring: Weekly sampling will include TSS, BOD, TDS, SSS, Ph, total nitrogen, nitrate, nitrite. VOC will be sampled semi-annually. All of the testing and sampling will be more frequent at project start-up until the baseline is established and the system settings are refined.

The project is consistent with the Colorado River Region Basin Plan.

Performance measures and their indicators for this project are tabulated below.

Table 2 - Project Performance Measures, HDWD Wastewater Treatment Plant

Objectives and Goals	Desired Outcomes	Output Indicators	Outcome Indicators	Measurement Tools and Methods	Targets
1) Construct a wastewater collection system to reduce the quantity of leachate from septic tank systems flowing into aquifers used for the District's potable water supply	Provide wastewater collection and treatment system that will allow terminating use of septic systems	Number of connections to wastewater collection system	Number of connections to wastewater collection system	Number of connections to wastewater collection system	175 connections in Phase 1a. (5,500 connections once all phases are implemented)
2) Treat wastewater to a level such that percolated effluent will not degrade groundwater quality	Treat wastewater to nitrate (and other constituent) concentrations less than	Nitrate (and other constituents) reduced to less than those in native groundwater	Direct comparison of treated effluent to native groundwater quality	Weekly sampling of effluent concentrations of nitrate (and TSS, BOD, TDS, SSS, Ph, total	Effluent nitrate concentrations of 10 mg/l or less; other constituents to less than ambient quality

Objectives and Goals	Desired Outcomes	Output Indicators	Outcome Indicators	Measurement Tools and Methods	Targets
	ambient quality			nitrogen, nitrate) at wastewater treatment plant before discharge to percolation ponds; Semi-annual VOC sampling	
3) Provide the core infrastructure for expansion of the collection, treatment and disposal system as needed either to further protect groundwater, or to accommodate growth in the District's service area	Construction of Phase 1a of the project	This objective and outcome will be met by the construction of the project	This objective and outcome will be met by the construction of the project	This objective and outcome will be met by the construction of the project	Constructed Phase 1a project
4) Maximize the total water supply available to the District	Recharge all treated wastewater by percolation to groundwater basin	All treated effluent percolated in recharge basins	Construct percolation basins and recharge piping; Discharge treated effluent to percolation basins		All treated effluent percolated in recharge basins
5) Minimize any adverse economic and environmental impacts on the community	Construct project to prevent RWQCB-imposed moratorium on new septic systems; Reasonable rates and charges; Environmental mitigations implemented	Project constructed on schedule dictated by SWRCB, avoiding moratorium on new septic systems and other punitive actions; Mitigation measures implemented; Grant funds received from several sources	Moratorium on new septic systems and other punitive SWRCB actions avoided	All mitigation measures implemented; Grant funds received from several sources, keeping rates and charges reasonable	Phase 1a completed by September 2013; All phases complete by 2016
6) Provide sufficient treatment capacity to ensure continuous compliance with anticipated regulatory requirements for an average annual wastewater flow of	Design and construct 0.125 mgd Phase 1a treatment plant to meet	This objective and outcome will be met by the construction	Project constructed and treatment process effective	Project constructed; Effluent water quality monitoring	Phase 1a completed by September 2013; Effluent testing results

Objectives and Goals	Desired Outcomes	Output Indicators	Outcome Indicators	Measurement Tools and Methods	Targets
0.125 mgd	anticipated regulatory requirements	of the project			within regulatory requirements
7) Provide for future expansion of the plant to an annual average flow capacity of 4 mgd	Preliminary design with accommodation for future expansion; Purchase land adequate for treatment plant expansion	Completed preliminary design report with consideration for full buildout; Land purchases	Build-out expansion considered in preliminary design report	Completion of preliminary design report; Land of adequate size purchases	Completion of preliminary design report by March 2011; Land of adequate size purchased

Additional monitoring requirements specified by the Colorado River Basin Regional Water Quality Control Board are in draft form¹, and are included in this application as “Att6_IG1_MWA_Measures_2ofTotal2”.

¹ Colorado River Basin RWQCB, July 22, 2009 Draft Order No. R7-2009-0059 Waste Discharge Requirements for Hi-Desert Water District, Owner/Operator Water Reclamation Facility, Town of Yucca Valley San Bernardino

MOJAVE WATER AGENCY TURF REMOVAL CONSERVATION INCENTIVE PROGRAM

The Mojave Water Agency “Cash For Grass” program has been operating for over two years, and the program procedures are well established. Applicants for the turf removal rebates must sign a contract to complete the work within a specified period of time, and are subject to pre- and post-conversion inspections to ensure eligibility and performance. The program requirements are described in greater detail following presentation of the Project Performance Measures. The project is consistent with the South Lahontan Region Basin Plan.

Applicants are contractually obligated to maintain the new landscape for two years, and follow-on audits have not found any reversions to turf. To confirm the longevity of the program, MWA will conduct follow-on audits and summarize this information in its Urban Water Management Plan, published every five years.

Performance measures and their indicators for this project are tabulated below.

Table 3 - Project Performance Measures, MWA Turf Removal

Objectives and Goals	Desired Outcomes	Output Indicators	Outcome Indicators	Measurement Tools and Methods	Targets
1) Incentive removal of up to six million square feet of turf grass to produce a long-lasting reduction in water demand of 1,012 acre-feet per year; and	Signed contracts for six million square feet; Measured water conservation of 1,012 acre-feet per year	Signed contracts; Before- and after-conversion inspections and water audits	Before- and after-conversion inspections and water audits	Signed contracts; Completed conversions; Measured water savings	Three million square feet of conversion contracts in each of next two years; Measured water savings of 1,012 acre-feet or more after the second year
2) Track long-term performance of the program, and make this information available to other water suppliers and interested parties.	Water savings of 55 gallons/square foot/year; Low replanting of turf grass	Before- and after-conversion inspections and water audits; Follow-up telephone audits and inspections to determine rate of reversion to turf plantings	Before- and after-conversion inspections and water audits; Follow-up telephone audits and inspections to determine rate of reversion to turf plantings	Before- and after-conversion inspections and water audits; Follow-up telephone audits and inspections to determine rate of reversion to turf plantings; Report results in UWMPs	Water savings of 55 gallons/square foot/year; Low replanting of turf grass after 10 years

The amount of water saved from the first two years of the turf replacement incentive has exceeded the conservation amounts that were achieved by any other incentive, including high efficiency toilet rebates and vouchers, and high efficiency clothes washer rebates. The turf removal incentive saves over 55 gallons per year per square foot of irrigated turf² removed including replacement with xeriscapes and native desert plants. These have been directly attributed and measured back to individual bills and account savings of the customers who have participated in the program³. The FY 12-FY 13 stage of the program is expected to conserve a minimum of 1,012 additional acre feet per year.

The MWA 2004 Regional Water Management Plan includes municipal conservation as a key element in meeting 2020 water supply needs. This target conservation equates to 4,000 acre-feet in 2010 and 15,400 acre-feet per year by 2020. The 1,012 acre-foot per year savings represents approximately 7 percent of planned 2020 conservation.

To date, the water conservation incentive programs have saved an estimated 14 percent of the 2020 conservation target.

There are two primary performance measures for ensuring and quantifying project benefits:

1. Pre- and Post-Conversion Inspections
2. Water Meter Monitoring

Pre- and Post-Conversion Inspections

Pre- and post-conversion inspections are an integral part of the program. Pre-conversion inspections confirm eligibility and document pre-project conditions, and post-conversion inspections ensure that the water conservation benefit will be obtained prior to disbursement of any program funds.

Pre-Conversion Inspection

Pre-inspections and approval of an applicant's existing landscapes will be conducted by the participating local water district. Applications must be pre-approved before removal of any lawn or otherwise beginning a conversion. Photos of the existing lawn will be taken during the landscape pre-inspection.

Post-Conversion Inspection

Once the landscape conversion project is finished, the applicant is responsible for notifying the local water district of completion. The applicant or authorized representative is required to be present during the post-inspection. The post-inspection include taking photos of the converted landscape, obtaining converted landscape area measurements, irrigation system inspection, plant eligibility review for

² See footnote **Error! Bookmark not defined.**

³ We have been able to show up to 84 gal/ft²/yr in the Apple Valley Ranchos service area; 55 gal/ft²/yr is believed to be a conservative estimate of actual conservation savings.

program compliance and rebate eligibility verification. If the converted landscape or irrigation system fails inspection, the applicant is notified, provided an explanation, and allowed 60 (sixty) days or the remainder of the six-month period, whichever is greater, to fully comply with the program conditions.

Water Meter Monitoring

Local water agencies all meter water supplies, and may audit pre- and post-conversion water use of applicants to measure the effectiveness and longevity of the turf replacement program as a water conservation tool.

The projected water savings for the turf replacement incentive program is based on metered savings which have averaged 55 gallons of water per year saved per square foot of turf replaced with xeriscape. Individual retailer service area studies have shown savings of up to 84 gallons per square foot.

MWA has been funding water conservation incentives to 25 retail water agencies and well owners since February 2008. Providing financial incentives for water conservation is a key implementation strategy in the MWA's adopted Demand Management Measures⁴. As a signatory to the California Urban Water Conservation Council (CUWCC) Memorandum of Understanding, MWA has pledged to implement conservation Best Management Practices (BMPs) to reduce current and future water demands through more efficient water use, including providing financial incentives to retail agencies within the service area. This has been accomplished through offering three incentive programs:

- high efficiency toilet rebates and vouchers
- high efficiency clothes washer rebates, and
- turf removal incentives with information on low water using landscapes

The turf removal component has produced the most cost effective results and has fostered the highest level of water savings of these three components. With additional funding, this level of community support and participation in the program can continue to increase this cost-effective water use efficiency solution.

Eligibility Requirements

Conversion Sustainability Requirements

The landscape conversion area must remain in compliance with all program conditions for a period of two years. If the landscaping is altered during this two year period, the applicant will be required to refund some or the entire rebate if this requirement is violated. Landscape and plant maintenance, plant quality and appearance before, during, and after the conversion are the sole responsibility of the applicant. This requirement is void upon property transfer of ownership.

1. Program application must be submitted and pre-approved by the serving water district before removing any lawn and beginning the landscape conversion project.

⁴ Specifically, Demand Management Measure 10, Wholesaler Agency Programs

2. The water district may require the applicant's presence during the site pre-inspection before receiving approval for the project.
3. Areas to be converted must be living and maintained lawn.
4. Residential landscape conversion limits - zero square feet (sq. ft.) up to 6,000 sq. ft. maximum.
5. Commercial/Industrial/Institutional (CII) landscape conversion limits - zero sq. ft. up to 20,000 sq. ft. maximum⁵.
6. Applicant must participate in a post-inspection to receive final approval and sign-off of the landscape and irrigation system conversion before a rebate check will be issued.

Landscaping Requirements

Other Applicant Responsibilities

Mojave Water Agency and partnering water districts enforce only the conditions of this agreement. The applicant is responsible for complying with all laws, policies, codes and covenants that may apply. Program rebates for more than \$600 may be considered taxable income requiring IRS Form 1099 to be issued as required by law.

1. A minimum of 25% living plant coverage must be achieved within the converted area at plant maturity. This requirement will be determined during your pre-inspection.
2. Plant lists are available through local water districts and the Alliance for Water Awareness and Conservation (AWAC, www.hdawac.org)
3. Remaining lawn areas are not considered as plant cover.
4. Plants and lawn outside the converted area may be considered in the rebate calculation even if they are adjacent or overhanging into the area. This determination will be made during the pre-inspection.
5. Impermeable surfaces that do not allow water to penetrate into the ground are not allowed. This includes concrete, plastic film used as landscape fabric, and all other non-permeable materials.
6. Converted areas must be covered by a minimum two-inch layer of permeable mulch.
7. Mulches may include bark, rock, and un-grouted stepping stones.

Irrigation System Requirements

1. Spray irrigation is not permitted in the landscape conversion area.
2. If a spray irrigation system is currently being used, it must be converted to a low-volume drip system equipped with a pressure regulator, filter and emitters providing irrigation to new plantings.
3. Each drip emitter must be rated at less than 20 gallons per hour (gph).

⁵ Prior to conversion projects exceeding maximum square footage will be considered on a case-by case basis and subject to pre-approval by Mojave Water Agency.

4. If part of a lawn is converted, the sprinkler system must be properly modified to provide adequate coverage to the remaining lawn without spraying the converted area.